

APPENDIX: METHODS

Investing in Primary Care

The Missing Strategy in America's Fight Against Chronic Disease

Using data from the 2016–2022 Medical Expenditure Panel Survey (MEPS), we examined the impact of having primary care on health care service utilization – specifically, emergency department (ED) visits, hospitalizations, and health care expenditures – in both children and adults. Our specific aims were to investigate (1) the utilization of preventive care services among children and adults and (2) the rates of ED visits, hospitalizations, and total health care expenditures in children and adults with chronic conditions, comparing those with and without a usual source of care. We identified six chronic conditions in adults, based on the Agency for Healthcare Research and Quality (AHRQ) flags for priority conditions in MEPS: asthma, chronic obstructive pulmonary disease (COPD), diabetes, heart disease, hypertension, and stroke. For children, we identified four chronic conditions based on AHRQ priority conditions: asthma, attention deficit hyperactivity disorder, diabetes, and epilepsy. A dichotomous measure was created for respondents who had at least one chronic condition.

The independent variable in our study was the presence of a usual source of care (PCP USC) compared to those without a usual source of care. The primary outcomes focused on preventive care services utilization, ambulatory care-sensitive ED visits, hospitalizations, and total health care expenditures. We created four preventive care measures for adults: checking blood pressure and cholesterol, flu vaccination, and tobacco use screening. For cancer screening, we examined Pap tests, mammograms, and colon cancer screening. Among children, we investigated measures related to obesity prevention, accident and injury prevention, smoking's effects, and vision testing.

Additionally, we developed binary measures for ED visits and hospitalizations related to ambulatory care-sensitive conditions in adults using the AHRQ's Prevention Quality Indicators, and in children using the Pediatric Quality Indicators. We also created dichotomous measures for any ED visit and hospitalizations. To analyze the data, we utilized cross-tabulations for preventive services and conducted multivariate regression analyses to explore the association between having a usual source of care and rates of ambulatory care-sensitive ED visits, hospitalizations, and total health care expenditures among children and adults with any chronic condition.

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We also examined the association between continuity of care (COC), as measured by the Bice-Boxerman COC index and rates of hospitalizations, ED visits, and the costs for Medicare beneficiaries with chronic disease.

The sample included Medicare beneficiaries who were served by a 5% random sample of primary care clinicians (physicians, nurse practitioners, and physician associates) and who had a diagnosis of hypertension, diabetes, COPD, asthma, stroke, and heart disease in 2018 and 2019. Beneficiaries were eligible for inclusion in our sample if they were older than 65 years at the start of 2018 and continuously enrolled in Medicare fee-for-service (FFS) Parts A and B for the two years. We further excluded beneficiaries with fewer than two outpatient evaluation and management (E&M) visits in 2018, due to the inability to construct continuity measures. The final analytic cohort included 657,197 unique beneficiaries, of whom 603,185 (92%) had hypertension, 241,972 (37%) had diabetes, 135,214 (21%) had COPD, 71,968 (11%) had asthma, 63,046 (8%) had stroke, and 279,586 (43%) had heart disease.

We constructed the Bice-Boxerman COC index using the relative share of all of a beneficiary's E&M visits billed by distinct clinicians in 2018. The index ranges from 0 (each visit involved a different clinician) to 1 (all visits to a single clinician). The average continuity of care score was 0.33. We examined whether the beneficiary had at least one avoidable hospitalization or avoidable ED visit in 2019, defined by the AHRQ. We measured the total Medicare Parts A and B costs of care by summing the allowed charge amounts.

For each condition, we used a multivariable logistic regression to estimate the probabilities of avoidable hospital admissions and ED visits. We used ordinary least square regression to estimate the total costs (logged). All models controlled for age, sex, race/ethnicity, dual eligibility status, number of chronic conditions, and region.

Limitations

MEPS. Medical conditions, including chronic and ambulatory care-sensitive conditions, were self-reported by the MEPS-Household Component respondents from a list of ICD-10 conditions. Interviewers recorded those not listed verbatim, and professional coders then transcribed them into fully specified *International Classification of Diseases (ICD) Tenth Revision, Clinical Modification* codes for the years 2016–2022. Diagnostic conditions in the publicly available MEPS data were collapsed to three-digit code categories to preserve confidentiality. They may not distinguish between diagnosis codes for specific ambulatory care-sensitive conditions. As with all pooled cross-sectional studies, this study cannot show causality.

Medicare. The study includes adults older than 65 years enrolled in Medicare FFS and may not be generalizable to populations in Medicare managed care and those with other types of health insurance. The cross-sectional design limits the ability to establish causality between continuity and outcomes.